DATA EVALUATION RECORD PAGE 1 OF

CASE: 85 TERBUTRYN

CONT-CAT: 01 GUIDELINES: 72-4

MRID: 48749

Ciba-Geigy, Limited (1976) The Determination of the 96-Hour LC50 in Rainbow Trout and Crucian Carp of GS 14260 for Residue Analysis Studies; the 16-Day Toxicity on Rainbow Trouts at a Nominal Substance (GS 14260) Concentration of 1 PPM for Residue Analysis Studies; Project No. Siss 4578. (Unpublished study received Aug 16, 1977 under 100-496; submitted by Ciba-Geigy Corp., Greensboro, N.C.; CDL:231315-C)

REVIEW RESULTS:

VALID X INVALID ____ INCOMPLETE ____

GUIDELINE: SATISFIED ___ PARTIALLY SATISFIED X NOT SATISFIED ___

DIRECT RVW TIME = 3 hr START DATE: 6/17/86 END DATE: 6/18/86

REVIEWED BY: Larry Turner

TITLE: Biologist

ORG: EEB/HED

LOC/TEL: 557-1977

SIGNATURE: Larry Turner DATE: 6/9/86

APPROVED BY: Norman Cook

TITLE: Head - Section 2

ORG: EEB/HED

LOC/TEL: 557-7446

SIGNATURE: Norman Cook DATE:

DATA EVALUATION RECORD

1. Chemical: Terbutryn, Shaughnessy #080813

2. Test Material: GS 14260 Technical; no % ai reported

3. Study Type: 96-hour Fish LC_{50}

   Species Tested: Rainbow Trout (Salmo gairdneri)
   Crucian Carp (Carasius carassius)

4. Study ID: Ciba-Geigy, Limited (1976) The Determination of the 96-hour LC_{50} in Rainbow Trout and Crucian Carp of GS 14260 for Residue Analysis Studies; the 16-Day Toxicity on Rainbow Trouts at a Nominal Substance (GS 14260) Concentration of 1 ppm for Residue Analysis Studies: Project No. SISS 4578. (Unpublished study conducted by Ciba-Geigy Ltd., Basel, Switzerland; submitted by Ciba-Geigy Corp., Greensboro, NC. MRID #48749, Accession No. 231315.)

5. Reviewed by: Larry Turner
   Biologist
   EEB/HED
   Signature: Larry Turner
   Date: 6/4/86

6. Approved by: Norman Cook
   Head-Section 2
   EEB/HED
   Signature: Norman Cook
   Date: 6.4-86

7. Conclusions:

Part I is scientifically sound, although inadequate to fulfill Guidelines requirements. With 96-hour LC_{50} values of 2.4 ppm for rainbow trout and 4.7 ppm for crucian carp, GS 14260 technical is considered moderately toxic to fish.

Part II is invalid and no conclusions may be drawn.

8. Recommendations:

N/A.

9. Background:

10. Discussion of Individual Test:

Two types of studies were conducted:

I. 96-hour fish acute toxicity studies with both species.

II. A 16-day fish study with rainbow trout, using only one concentration of 1 ppm. Exposure was for 4 days with a 12-day depletion period. Purpose was for analysis of residues in fish.

11. Materials and Methods:

a. Test Animals: Rainbow trout (Salmo gairdneri) with average weight of 8 g and average length of 86 mm, were obtained from "Mondli," Liestal, Switzerland, fish breeding station. Crucian carp (Carassius carassius) with an average weight of 7.5 g and an average length of 84 mm were obtained from "Barilli and Biaggi" fish breeding station, Bologna, Italy.

b. Test System: Static bioassay was conducted in 12 L glass tanks using reconstituted soft water. Loading was 2.7 g/L for trout and 2.5 g/L for carp. Test temperature was 14 ± 2 °C. An unspecified amount of acetone was used as a solvent. The trout tests were aerated continuously.

c. Dose: I. Trout: Control + 1, 2.1, 2.8, and 3.7 ppm.
Carp: Control + 2.8, 3.7, 4.9, and 6.5 ppm.
II. Trout: 1 ppm.

d. Design: I. 12 fish divided into three test vessels per test concentration; four concentrations plus control.
II. 49 fish divided into groups of seven fish harvested at days 1, 2, 3, 4, 8, 12, and 16.

e. Statistics: I. Probit analysis according to Goulden (1960).
II. No analysis reported.

12. Reported Results:

I. Study authors reported 96-hour LC_{50} values of 2.4 ppm for rainbow trout (NEL = 1 ppm) and 4.7 ppm for crucian carp (8% mortality at lowest level of 2.8 ppm).

II. No mortality occurred at the single concentration of 1 ppm; no delayed toxicity observed.

13. Study Author's Conclusions:

I. Rainbow trout 96-hour LC_{50} (95% ci) = 2.4 (2.2 to 2.6) ppm.

II. Rainbow trout exhibited no mortality or delayed toxicity at 1 ppm.

No QA measures were reported.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures:

I. The procedures generally followed acceptable methods, but there were significant deviations in size of fish, loading, aeration (for trout).

II. Procedures were for residue analysis and bore little resemblance to acceptable methods for assessing acute fish toxicity.

b. Statistical Analysis: Probit analysis according to the Stephan program produced the same LC_{50} values for both species, and nearly the same confidence limits. Analyses attached.

c. Discussion/Results: With 96-hour LC_{50} values of 2.4 ppm for rainbow trout and 4.7 ppm for crucian carp, technical terbutryn is considered moderately toxic to these two fish species.

d. Adequacy of Study:

1. Classification: I - Supplemental; II - Invalid.

2. Rationale: I. The % ai was not identified. Excessive loading, large size, aeration of trout study, crucian carp not an acceptable species.

II. No resemblance to a toxicity study.

3. Repairability: No.

15. Completion of One-Liner:

One-Liner Form completed May 19, 1986.

16. CBI Appendix: N/A.

turner terbutryn, ~~brown~~ rainbow trout lc50 (96-hour)

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
3.7	12	12	100	2.441406E-02
2.8	12	11	91.66667	.3173828
2.1	12	1	8.333334	.3173828
1	12	0	0	2.441406E-02

THE BINOMIAL TEST SHOWS THAT 2.1 AND 2.8 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 2.424871

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.1382548	2.264768	1.886029	2.629886

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	.270253	1	.9993798

SLOPE = 22.1467
95 PERCENT CONFIDENCE LIMITS = 10.63355 AND 33.65985

LC50 = 2.424829
95 PERCENT CONFIDENCE LIMITS = 2.220822 AND 2.646999

LC10 = 2.124389
95 PERCENT CONFIDENCE LIMITS = 1.778732 AND 2.301405

turner terbutryn crucian carp lc50 - 96-hour

Tech

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
6.5	12	10	83.33333	1.928711
4.9	12	7	58.33333	38.7207
3.7	12	2	16.66667	1.928711
2.8	12	1	8.333334	.3173828

THE BINOMIAL TEST SHOWS THAT 3.7 AND 6.5 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 4.647189

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.2549403	4.768025	4.062001	6.047353

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	.2492157	1	.7790386

SLOPE = 6.967247
95 PERCENT CONFIDENCE LIMITS = 3.489092 AND 10.4454

LC50 = 4.714021
95 PERCENT CONFIDENCE LIMITS = 4.072419 AND 5.627197

LC10 = 3.098205
95 PERCENT CONFIDENCE LIMITS = 2.038503 AND 3.674999